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Nathan Schumaker <[redacted]>

Latest HexSim Simulation

1 message

Nathan Schumaker <[redacted]> **Thu, Jul 29, 2010 at 2:32 PM**
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Cc: "[redacted]" <[redacted]>

Hi gang,

I've updated my HexSim baseline NSO scenario to incorporate feedback I got from several people.
Some of the changes include:

- The territory size is now 3 hexagons.
- I've changed the minimum quality for a hexagon to be used for a territory to 35. The minimum quality for a territory overall is now set to 3 x 35 = 105.
- I am again stratifying resource targets by modeling region. This resulted from a conversation with Brian. However, I found it unrealistic to set the actual resource target based on the home range data that Dave put together -- those values were too large. I suspect this is because they reflect the total resource, whereas owls only consume a fraction of this total. So what I've done is to use the mean values to set the relative size of the resource target. I set the resource target to 250 for birds in the Redwood Coast region, and then scaled up from there.
- I have added the barred owl impacts on Survival.
- I have adjusted the dispersal stopping criteria to reflect the mean territory score (45.35) identified in Dave and Jeff's tables.
- I have raised the minimum score for repulsion to 30. This means that repulsion starts when a hexagon is scored 30, and I've set it to ramp up linearly to 90% at a hexagon of score 0.
- I've adjusted the home range size data to reflect the discussion between Brandan, Bob, and Brian.

I'm not convinced that we have it right yet, for the following reasons:

1. The overall population size may be a little high. I'm getting ~2000 female owls. This can be raised or lowered by shifting the resource targets up or down. See Baseline C PopSize.pdf.

2. The population distribution through the landscape may be overly skewed to the south. This results from again stratifying the resource targets by region. The

northern regions have much higher resource targets. What I did was to set the resource target for the Redwood Coast to 250. Then I scaled to other regions up based on the mean home range size. For example, the Redwood Coast mean home range size is 14 hexagons. The Washington Olympics mean home range size is 128. 250 x 128 / 14 = 2286, which is what I set the OLY resource target to. This may be the wrong scaling factor. See Baseline C DSA Trands.pdf and Baseline C Occupancy (100+).png.

3. The distribution of dispersal path lengths (stage 0 owls only) seems overly skewed to the right. I'm referring to the full path length in hexagons, not the ultimate displacement distance. The maximum allowed currently is 250 hexagons. See Baseline C Dispersal Path Length.pdf.

I'm also attaching a table showing the observed frequency of home range hexagon qualities. See Explored Area Quality (100-250).txt.

Sorry to heap so much on you all.

Some things to consider are:

A. The MaxEnt data may account for some of the latitudinal shift in hexagon quality (Jeff has said so). At the same time, a hexagon scored 90 on the Olympic Peninsula is not equivalent to a hexagon scored 90 on the Redwood Coast (according to Brian). So we probably need to scale my resource targets less dramatically.

B. The dispersal stopping criteria is being used to halt dispersal when a single territory quality hexagon (score of 45.35 or more) is encountered. I'm also drawing path length from a uniform distribution set to [0, 250] hexagons. Together, these seem to be causing very few medium and long distance dispersal events. I could raise the stopping value, raise the minimum path length, both, etc. Any feedback on what this distribution should be shaped like? Note that the histogram I sent used a log scale.

That's it for the moment,

Thanks in advance for any feedback you might have.

Nathan

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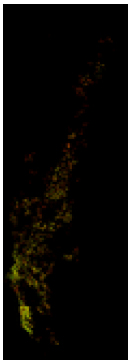
5 attachments



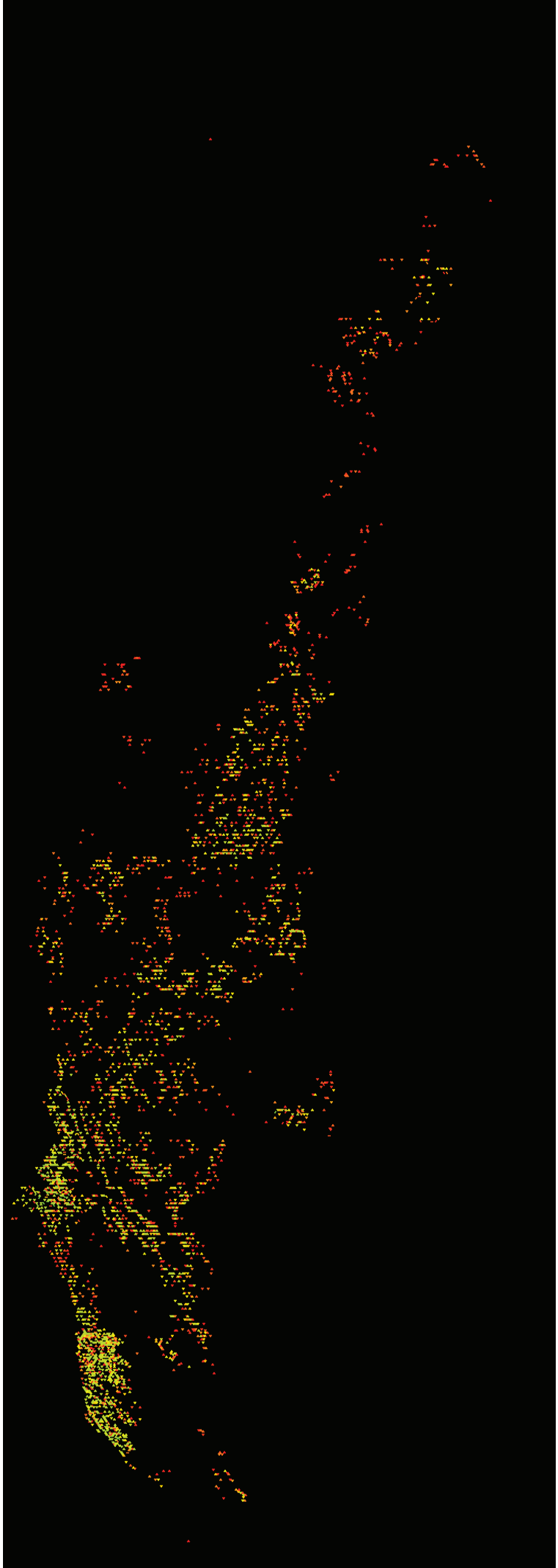
Baseline C Occupancy (100+).png
78K

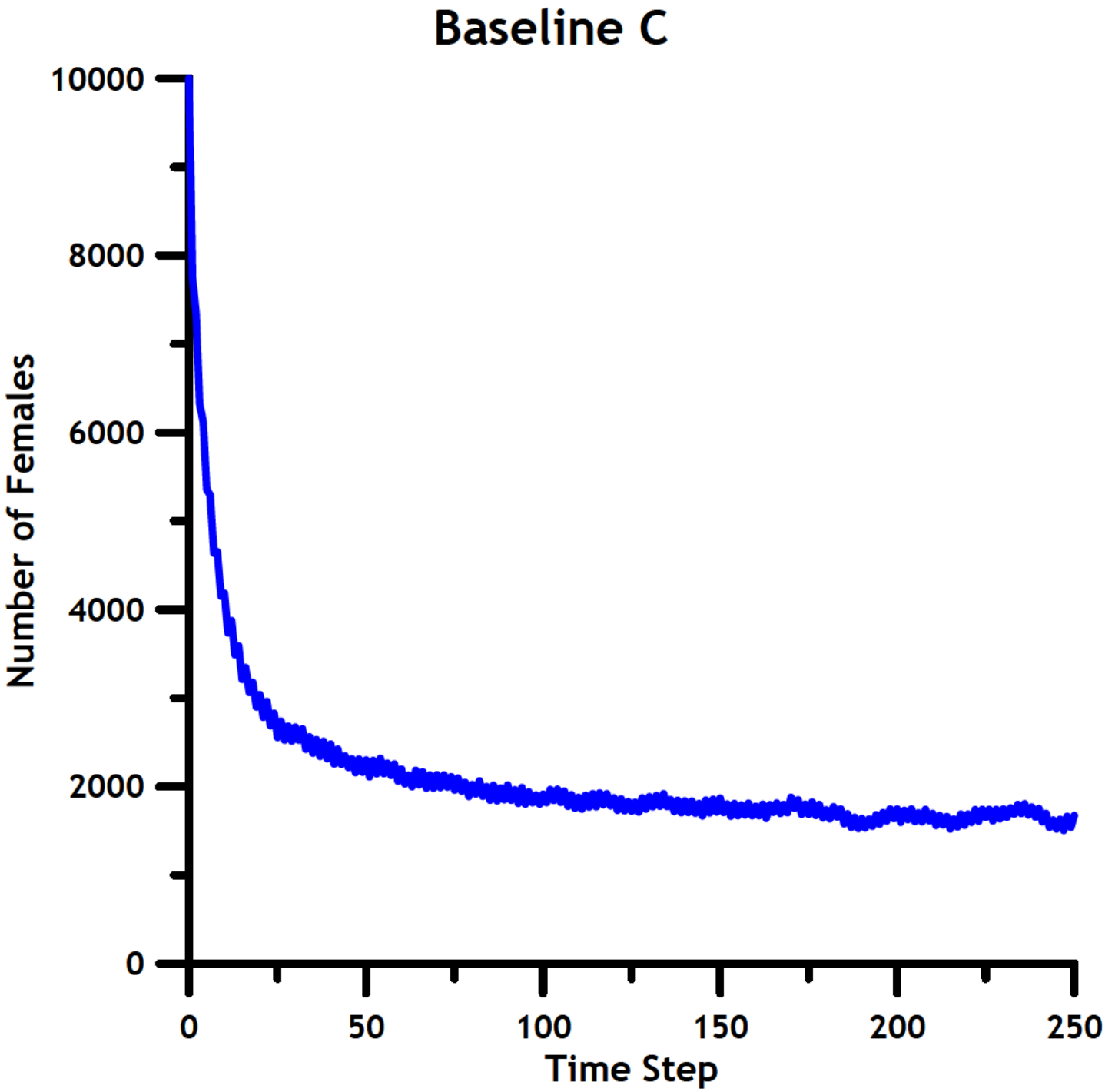
Explored Area Quality (100-250).txt
1K

Baseline C PopSize.pdf
16K

Baseline C DSA Trands.pdf
63K

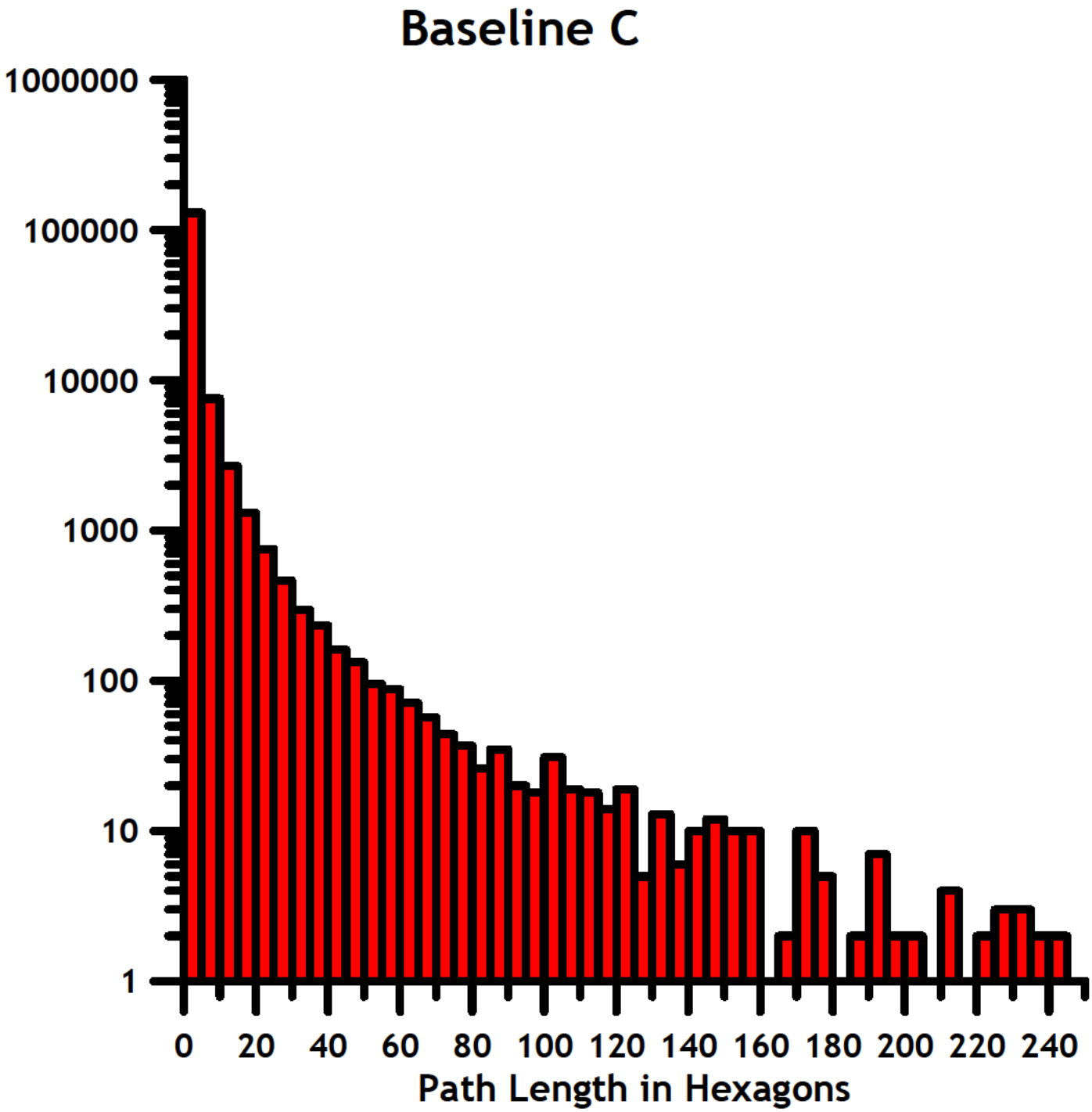
Baseline C Dispersal Path Length.pdf
16K

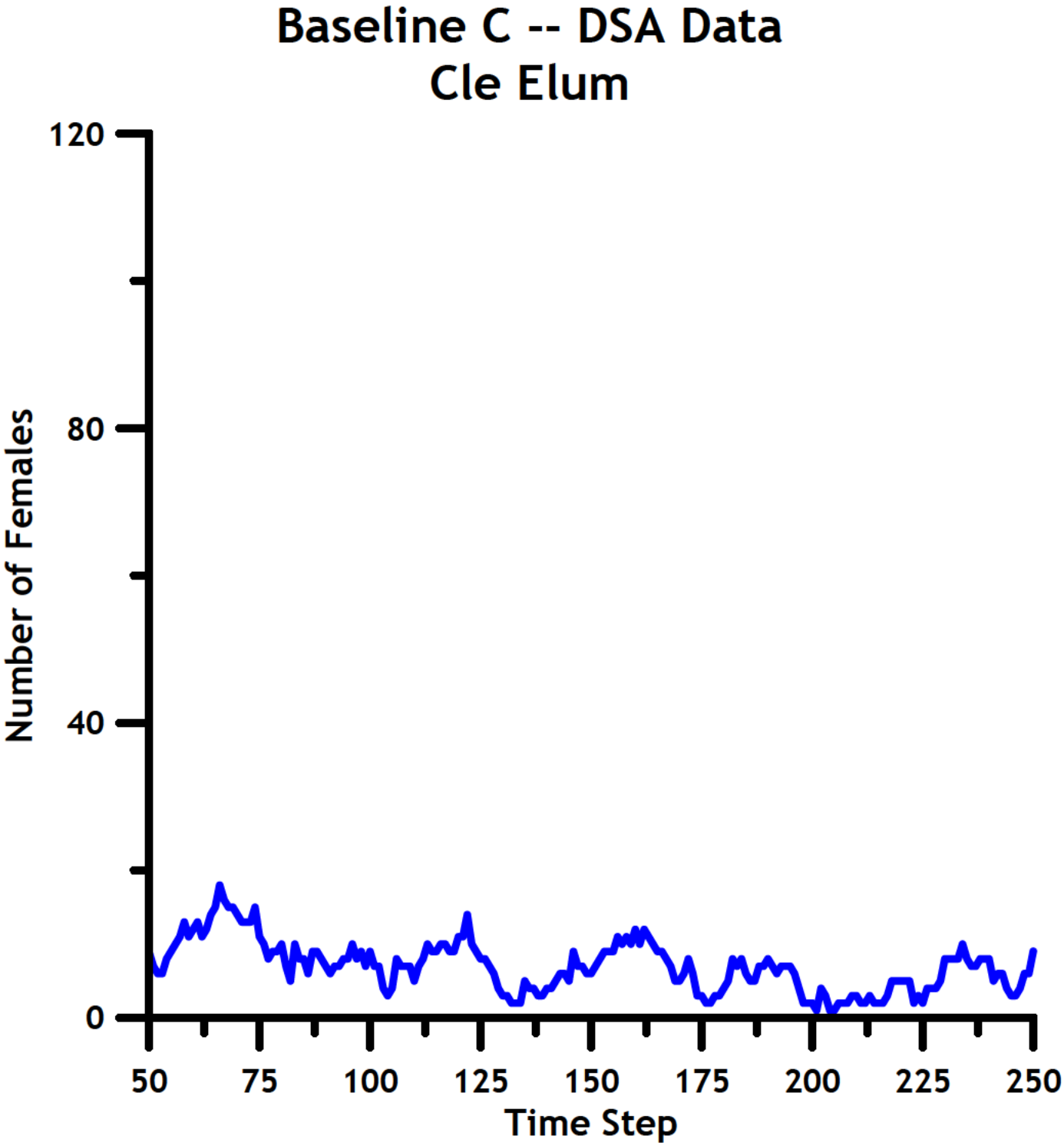


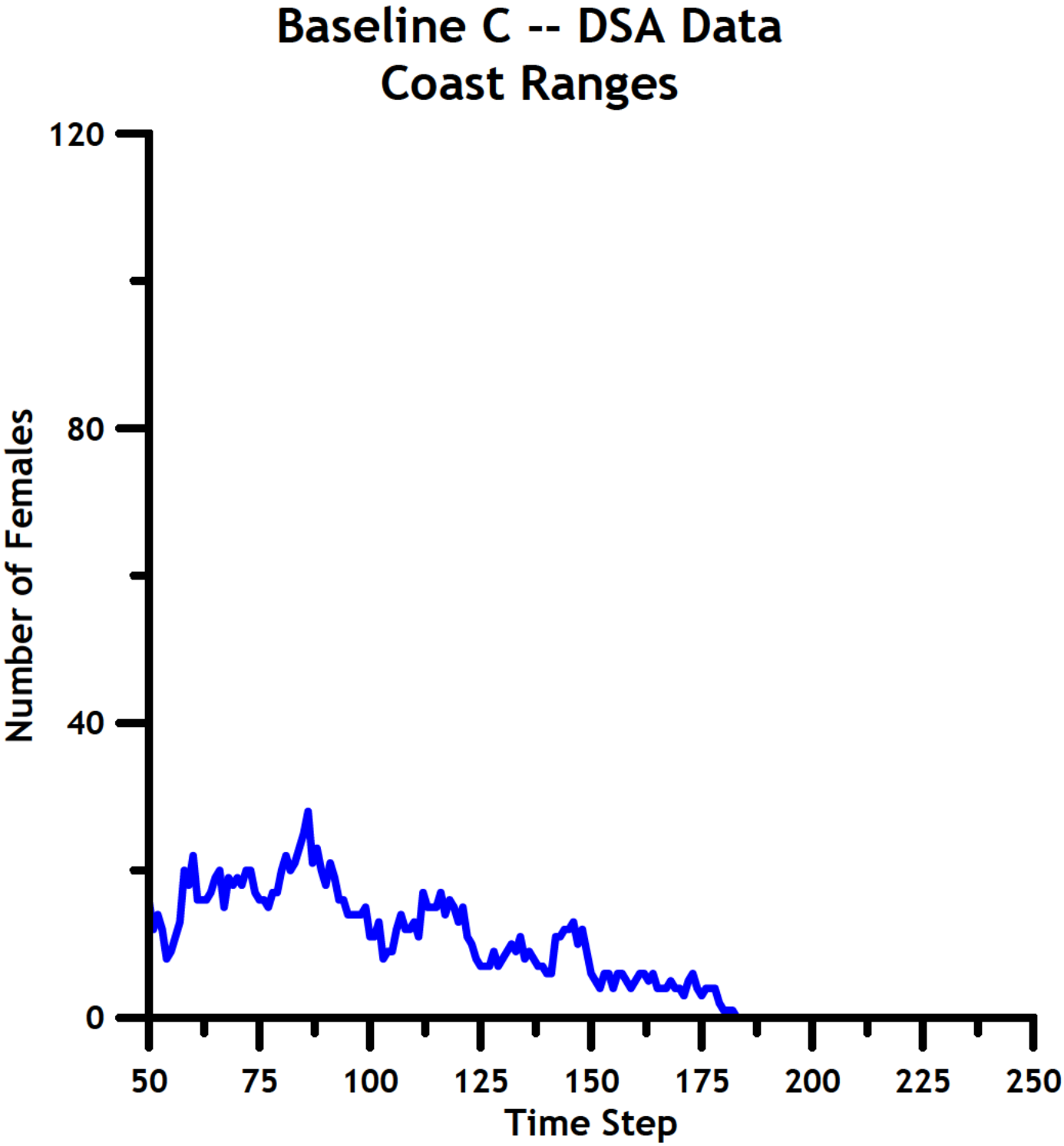

Baseline C
10000
8000
6000
4000
2000
0
Number of Females
0
50
100
150
200
250
Time Step

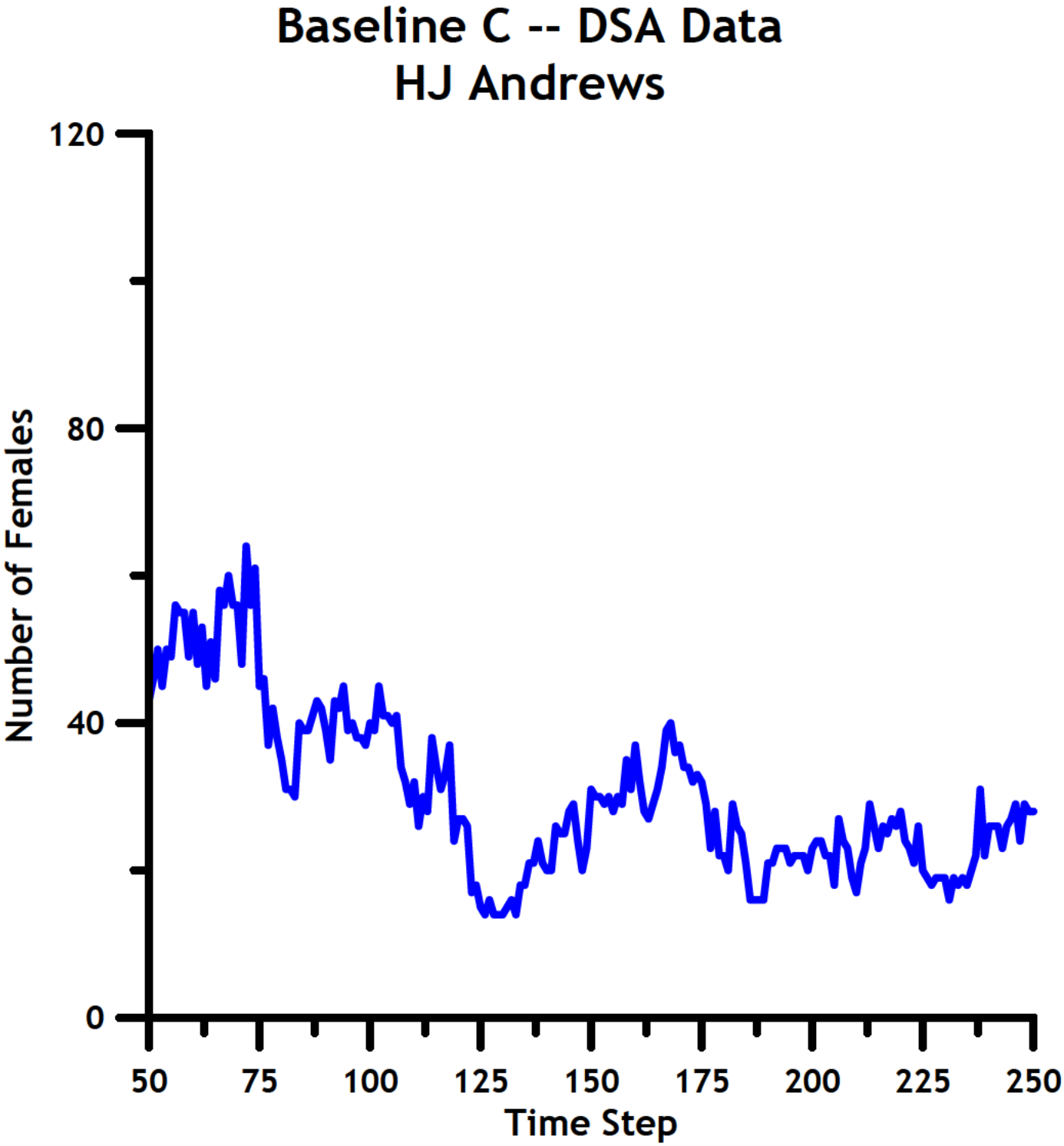
Baseline C
Time Steps 100-250

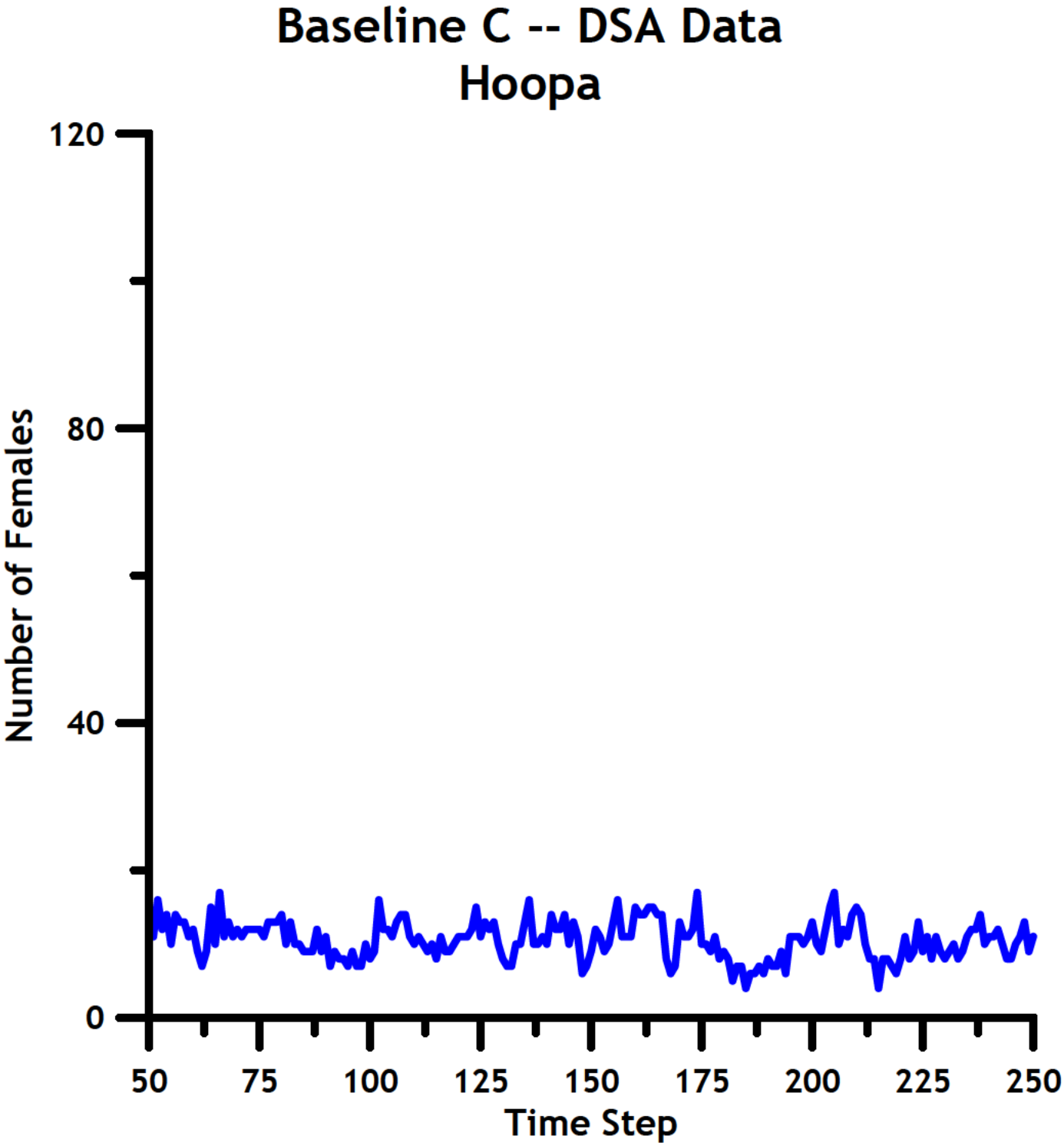
Mean Score of Home Range Hexagons	Mean Number of Individuals with this Score
0 - 5	0.03
5 - 10	0.05
10 - 15	0.13
15 - 20	0.28
20 - 25	2.00
25 - 30	6.85
30 - 35	41.58
35 - 40	143.85
40 - 45	365.86
45 - 50	520.36
50 - 55	444.68
55 - 60	163.54
60 - 65	34.99
65 - 70	2.92
70 - 75	0.28
75 - 80	0.00
80 - 85	0.00
85 - 90	0.00
90 - 95	0.00
95 - 100	0.00

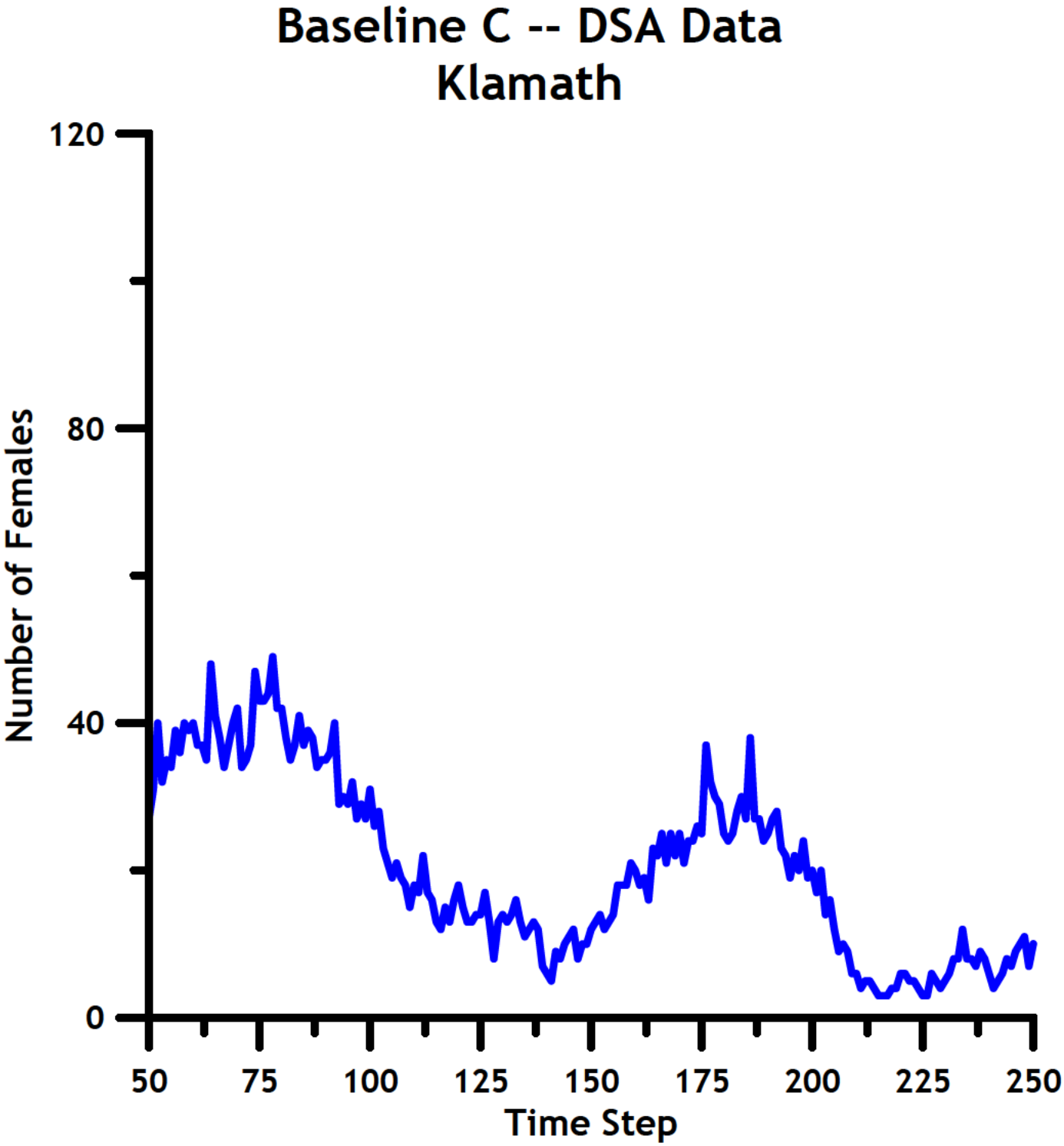

Baseline C
1000000
100000
10000
1000
100
10
1
0
20
40
60
80
100
120
140
160
180
200
220
240
Path Length in Hexagons

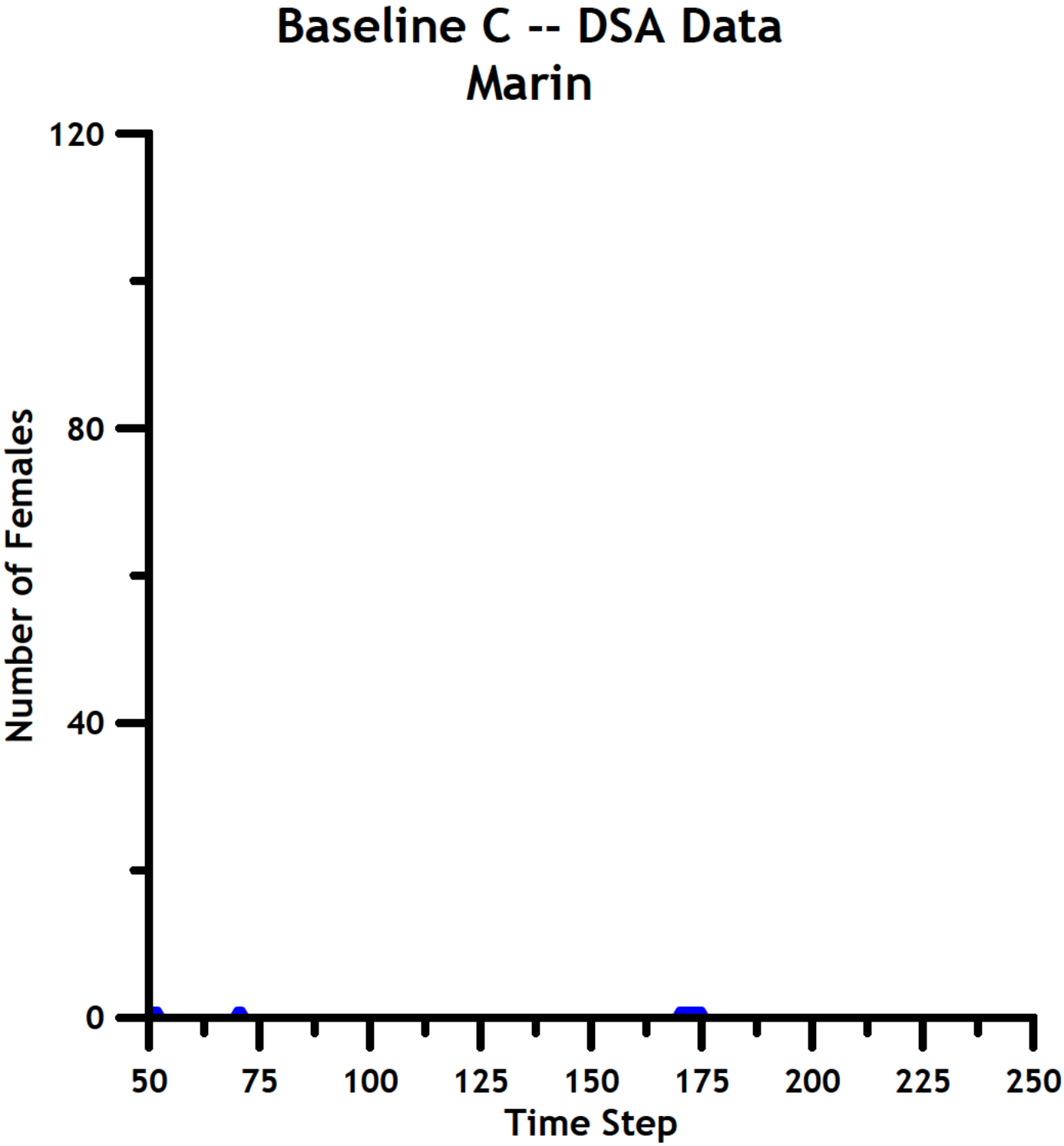

Baseline C -- DSA Data
Cle Elum
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step

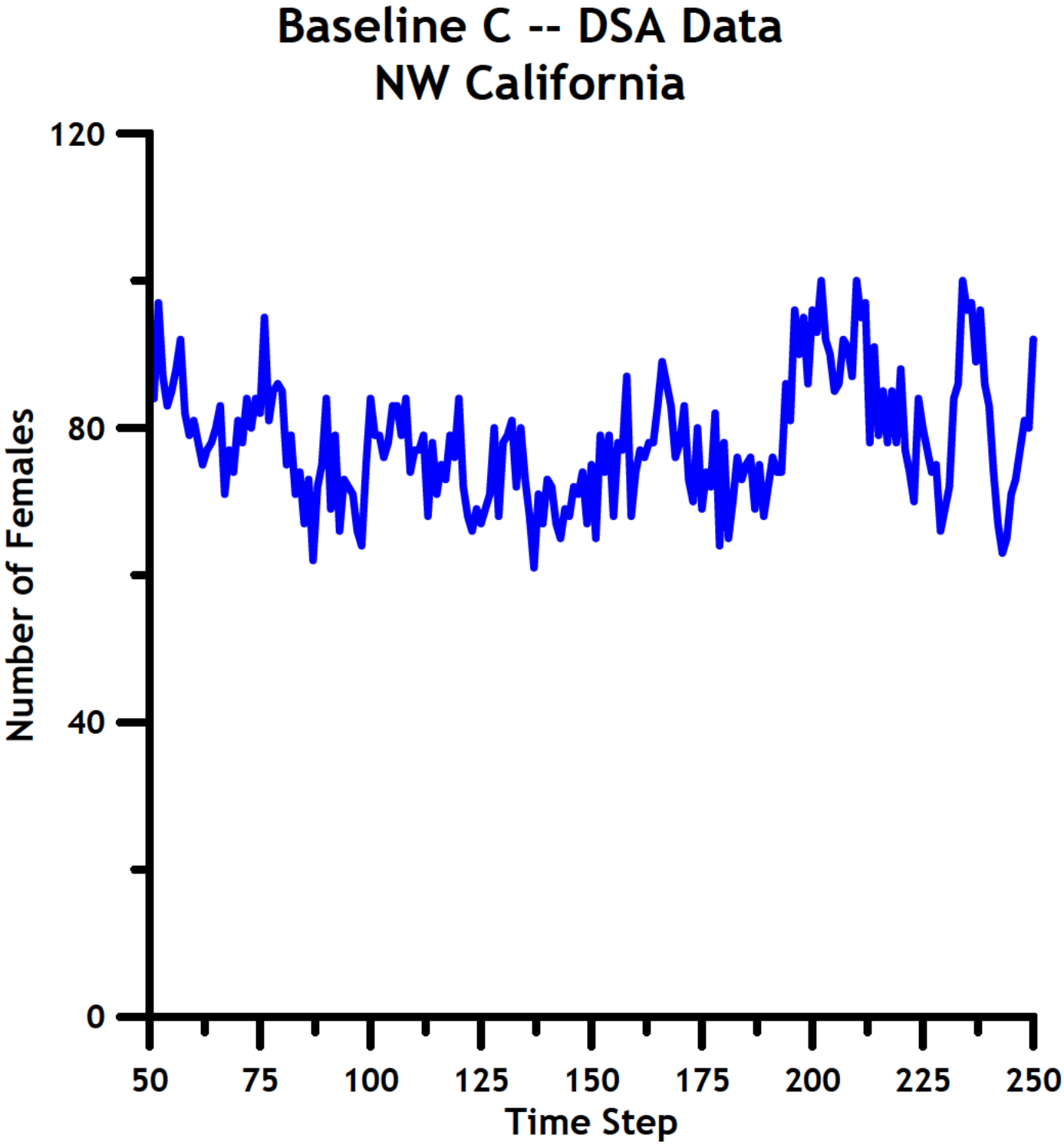

Baseline C -- DSA Data
Coast Ranges
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step

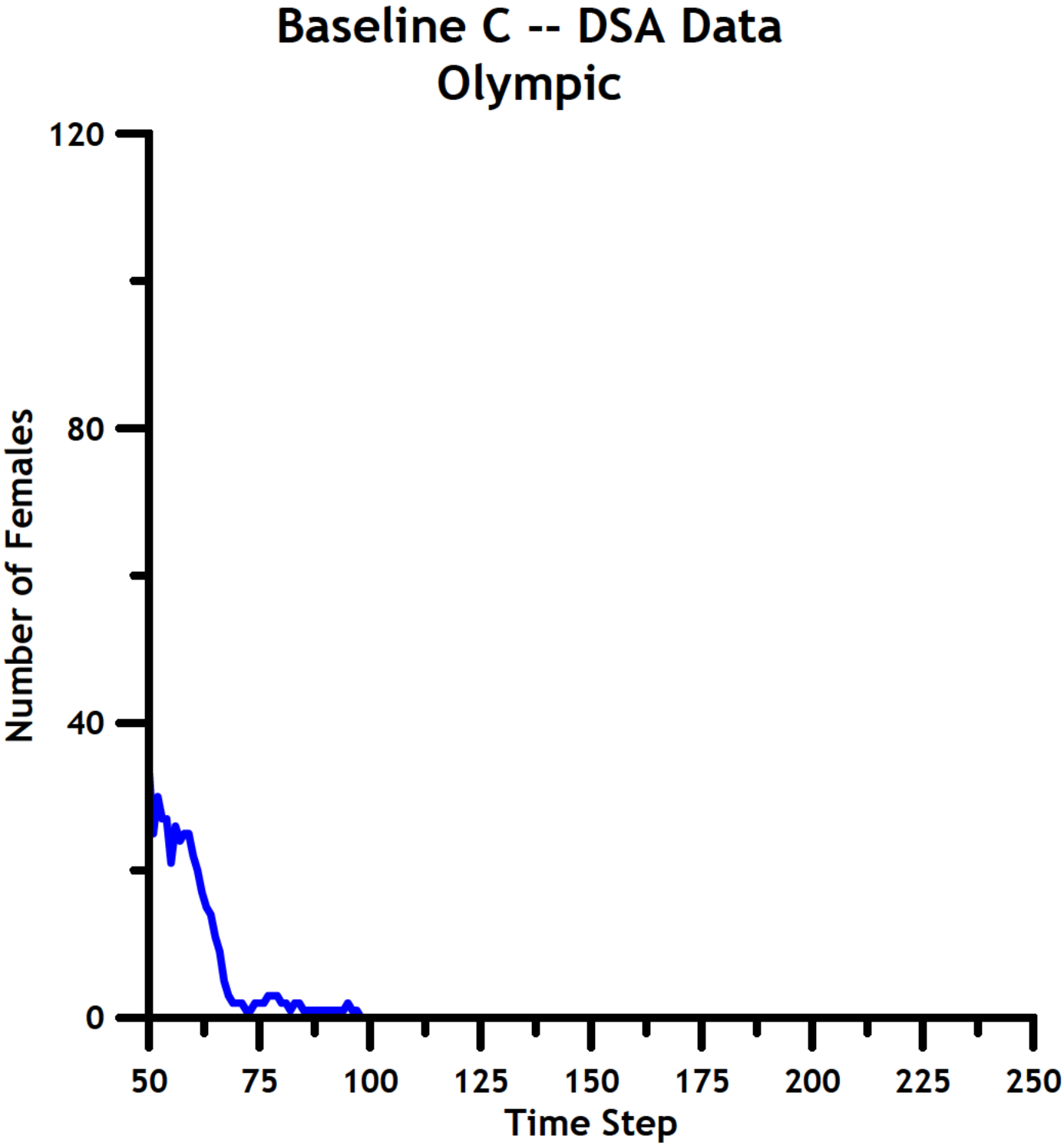

Baseline C -- DSA Data
HJ Andrews
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step

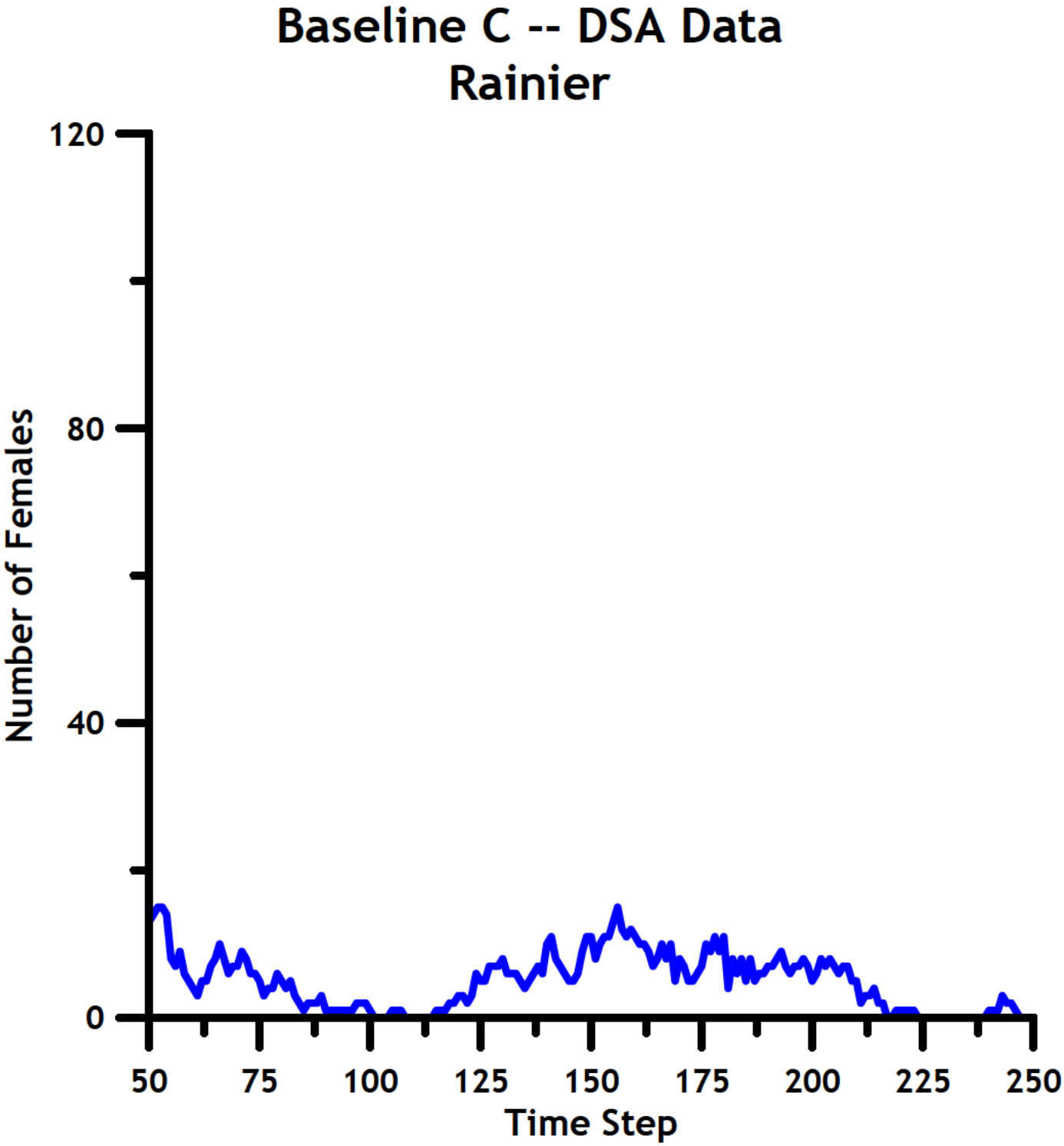

Baseline C -- DSA Data
Hoopa
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step

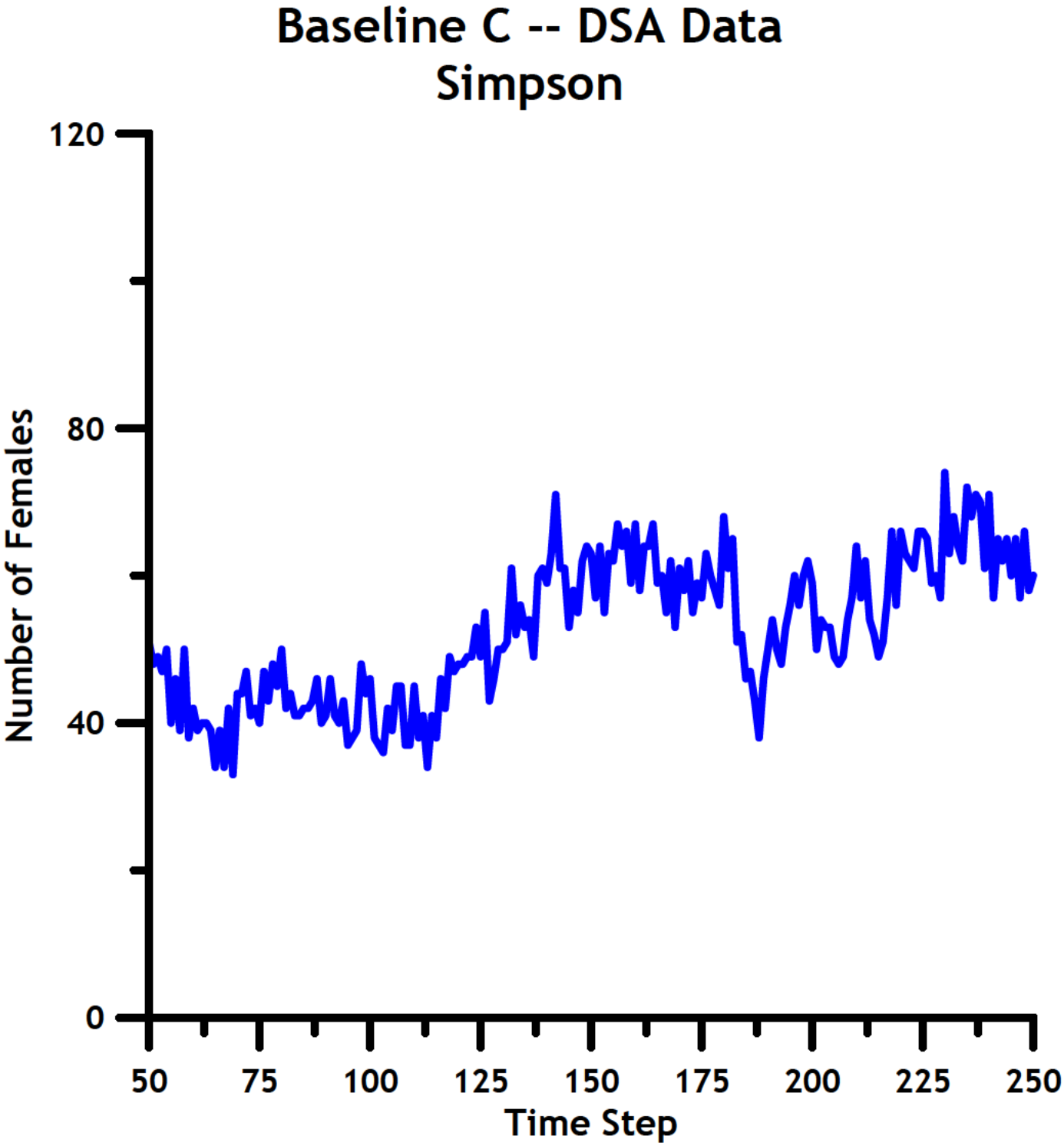

Baseline C -- DSA Data
Klamath
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step

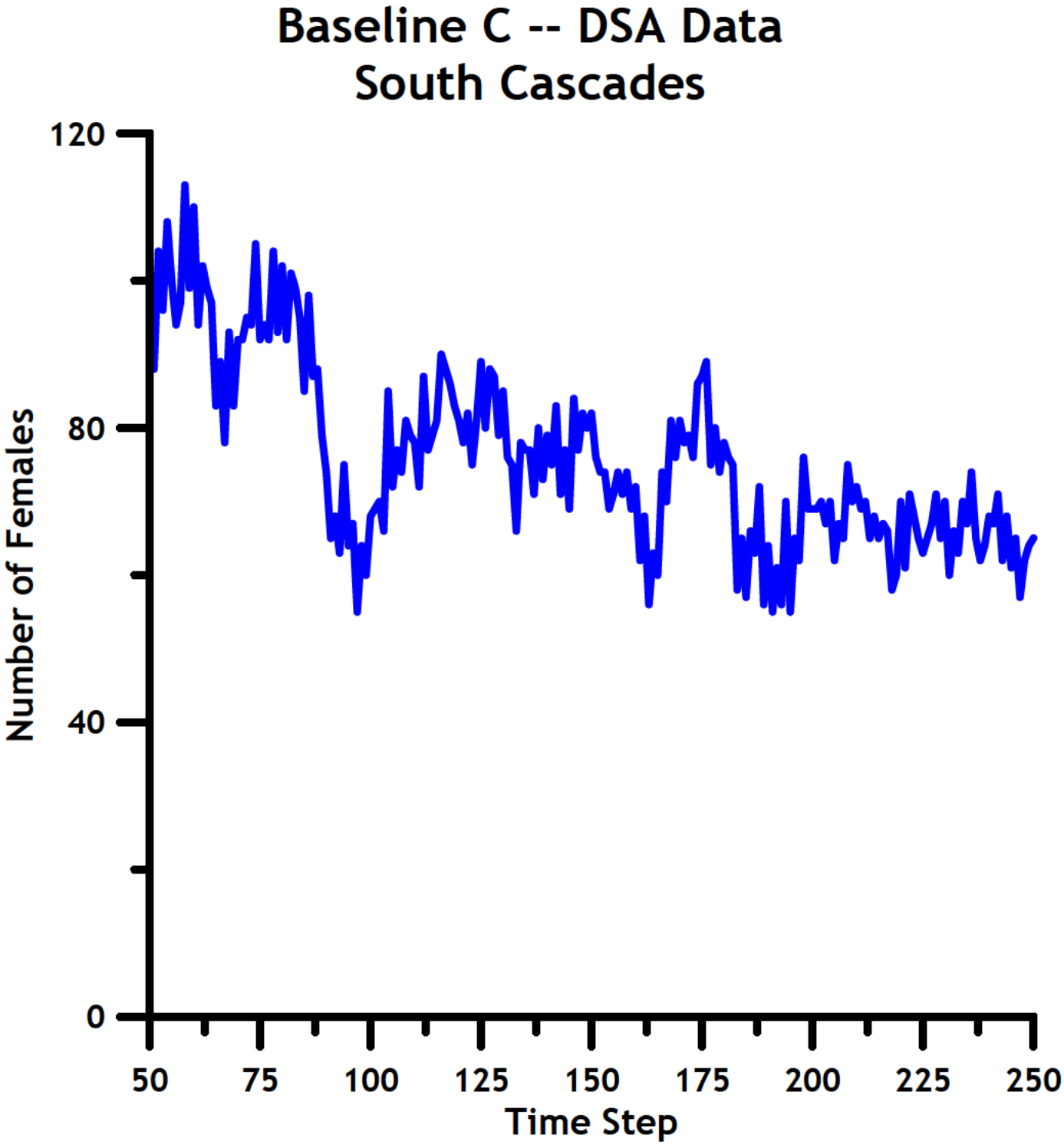

Baseline C -- DSA Data
Marin
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step

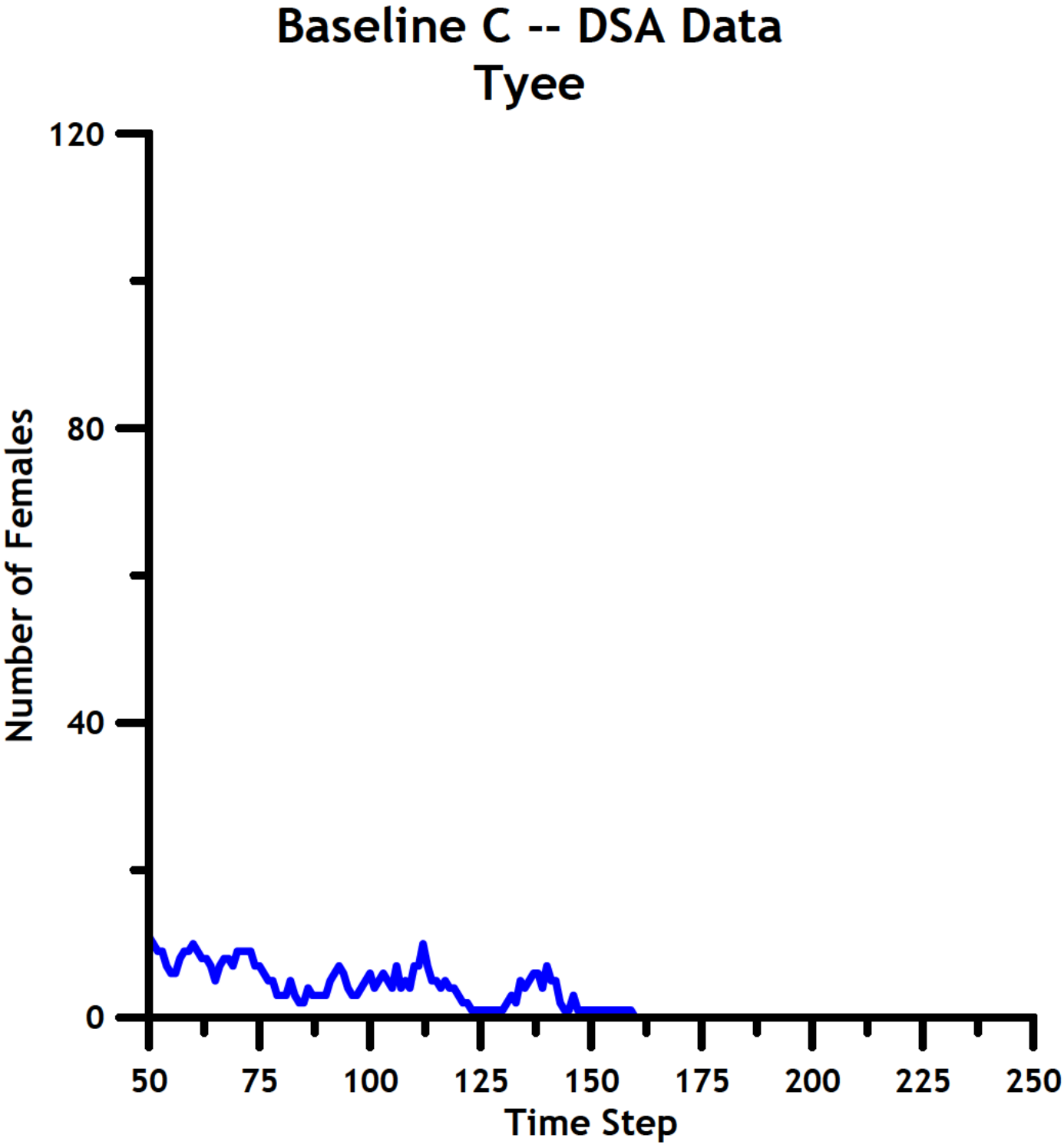

Baseline C -- DSA Data
NW California
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step

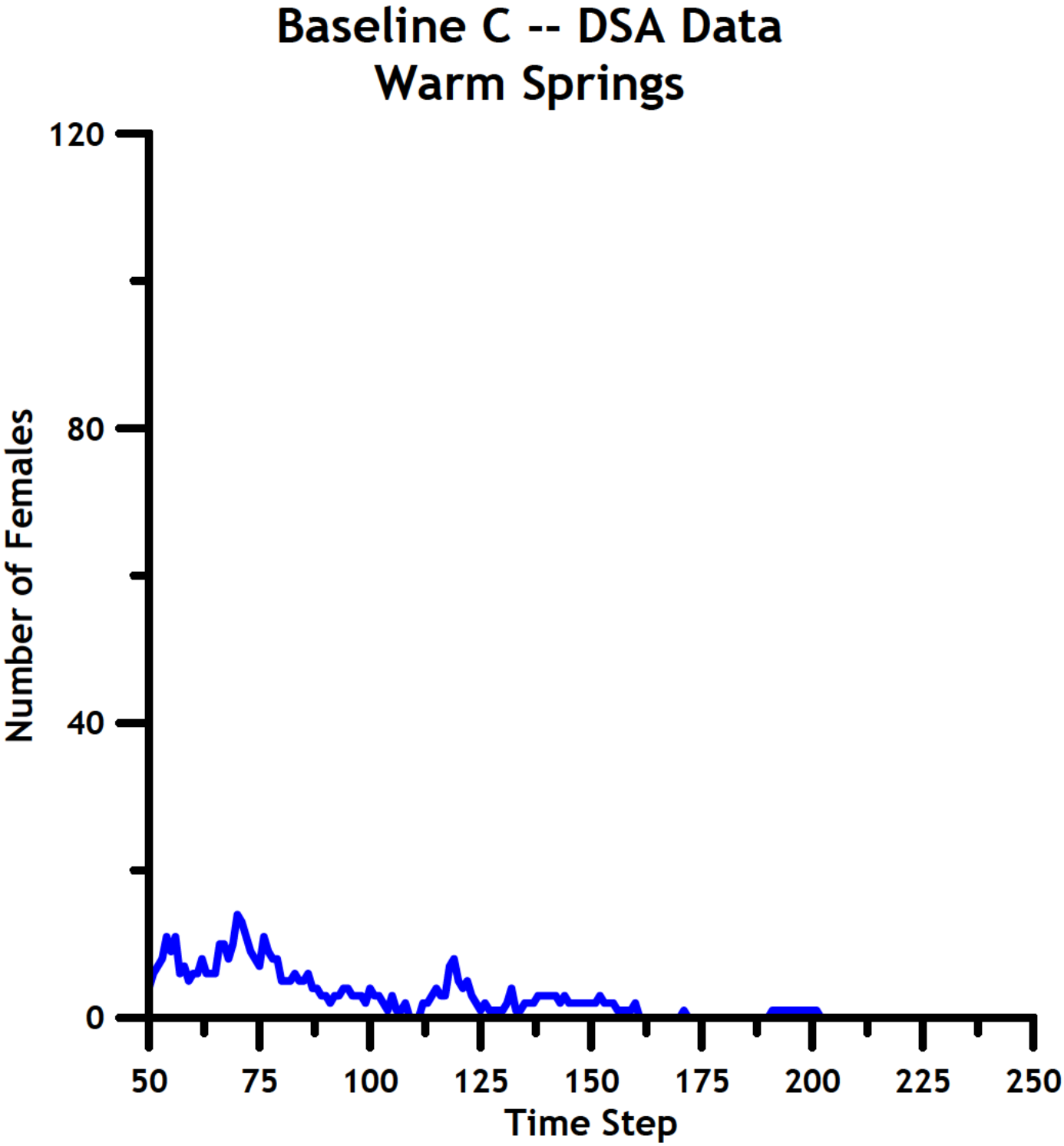

Baseline C -- DSA Data
Olympic
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step

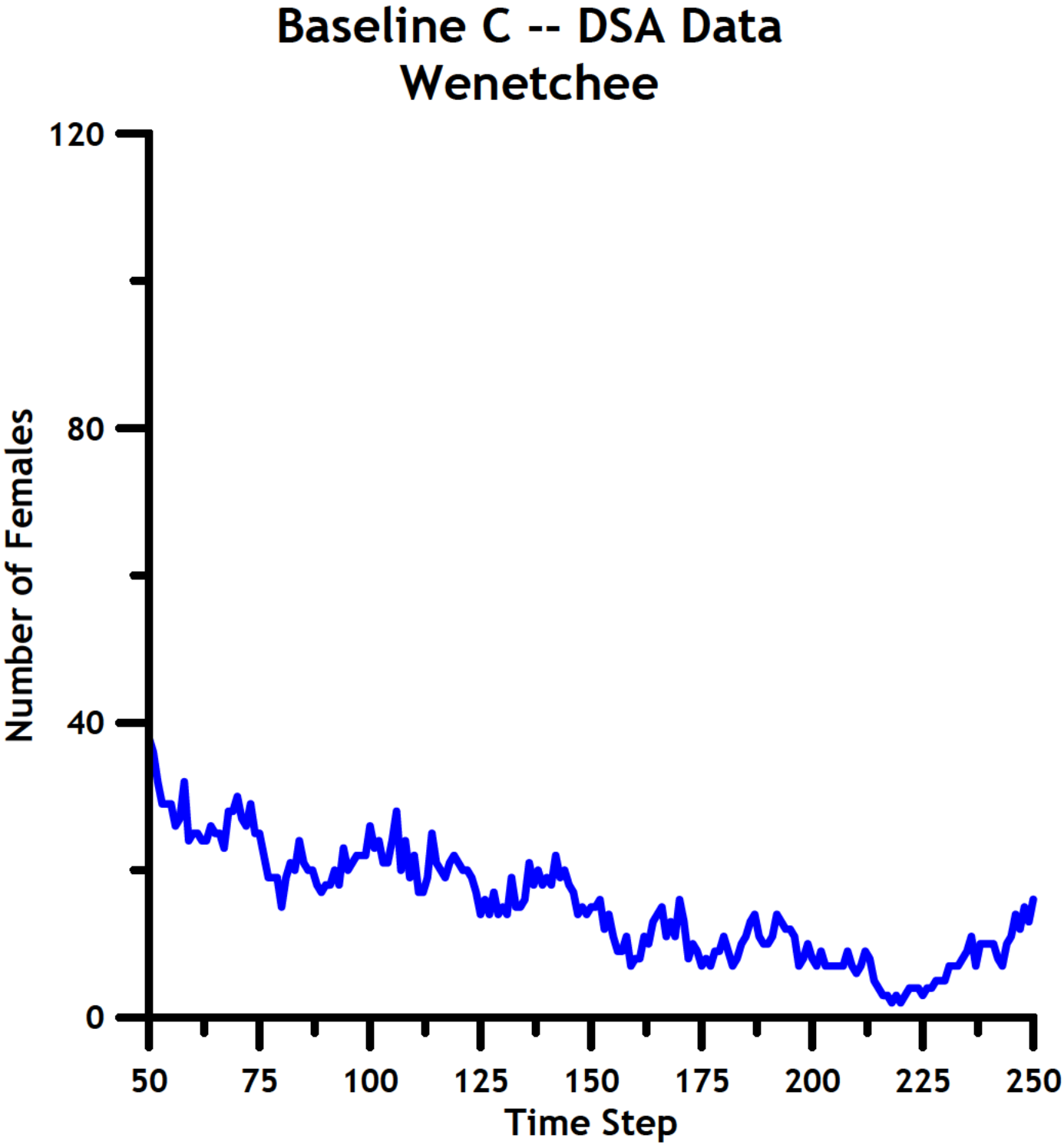

Baseline C -- DSA Data
Rainier
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step


Baseline C -- DSA Data
Simpson
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step


Baseline C -- DSA Data
South Cascades
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step


Baseline C -- DSA Data
Tyee
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step


Baseline C -- DSA Data
Warm Springs
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step


Baseline C -- DSA Data
Wenetchee
120
80
40
0
Number of Females
50
75
100
125
150
175
200
225
250
Time Step